

SIAS

Apprenticeship Standard

Science Manufacturing Process Operative (ST0422)

Work Based Learning Guide

December 2017



Purpose of document

This work based learning guide contains the detailed specification of the level of skills, knowledge and behaviours required to achieve occupational competence in the development phase of the Apprenticeship Science Manufacturing Process Operative.

The work based learning guide has been developed by employers and will be maintained to reflect any future changes that are needed to maintain world class levels of quality and ensure that the credibility and consistency of the apprenticeship outcome is maintained. The apprenticeship outcome is described in Apprenticeship standard Science Manufacturing Process Operative.

The mandatory assessment process that leads to the Apprenticeship award is available from info@siasuk.com.

Work Based Learning Guide – Science Manufacturing Process Operative

REQUIREMENTS: KNOWLEDGE	
Std Ref	
S1	Science manufacturing industry plant and equipment, including: pumps, valves, temperature gauges, filtration equipment, tanks, vessels and production/processing machinery such as automated production lines and assembly operations.
1	Basic understanding of the science and technology that underpins the manufacturing process.
2	Can explain the layout of plant and equipment in the area of responsibility
3	Understands the function of plant equipment including, pumps, valves and gauges to measure temperature, pressure, flow and level
4	Understands the function of process plant including filtration tanks, vessels, manual and automated machinery used in production and assembly lines
5	Understands the technology used in the process, including the use of computer systems for supporting the process or data storage
S2	How to operate the above plant and equipment, to process/manufacture, assemble and finish industry component parts or finished products and materials in a science manufacturing environment.
6	Understands how to read the standard operating procedures (SOPs) used in the preparation of materials, plant and equipment for a machine process and/or a hand based operation
7	Understands how to read and follow information from process flow schemes, diagrams and process descriptions
8	Understands the operation of plant equipment including, pumps, valves and gauges to measure temperature, pressure, flow and level
9	Understands the operation of process plant and equipment, including filtration tanks, vessels manual and automated machinery used in production and assembly lines
10	Knows the assembly and product finishing processes used in the production and assembly lines
11	Can explain the component parts of the completed product/s used in the assembly process

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S3	Process manufacturing improvement techniques for example 5S Methodology and Good House Keeping improvements and their application in a science manufacturing environment.
12	Understands the use of simple problem solving methods to resolve plant issues and problems
13	Knows how to use basic root cause analysis to support problem solving
14	Understands the process to escalate problems or issues related to abnormal conditions when unable or unauthorised to resolve them
15	Knows the concepts of resource efficiency when applied to energy, water, waste and the recycling of materials and products
S4	The organisational structure of their science manufacturing company and their role within it.
16	Knows the organisation's structure, its main departments, how these are interrelated and where the role holder fits into this structure
17	Knows the main business objectives of the organisation
18	Basic knowledge of the business landscape in which the employing organisation operates
S5	Their organisation's ethical practices and codes of conduct.
19	Knows the Code of Conduct in the organisation and understands the why complying with it is important
20	Knows of all relevant organisation policies pertaining to ethical practices, codes of conduct, diversity and equality in the workplace
S6	Regulatory compliance and policies typically required by science manufacturing employers, for example external GMP and internal polices required for 'clean room' practices.
21	Understands the external regulatory requirements pertinent to the sponsoring company & relative specialism in which they operate (e.g. COMAH, MHRA, FDA, ONR, Animal Scientific Procedures Act 1986 and Directive 2010/63/EU (ETS123 Guidelines))
22	Understands the internal regulations pertinent to the sponsoring company & relative specialism in which they operate (e.g. Good Laboratory Practice, Good Manufacturing Practice, Good Documentation Practice)

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23	Where clean room practices are part of the normal operations of the manufacturing operator be fully aware of the pre-entry gowning procedures, entry requirements and any additional PPE needs, safely work on permissible tasks in the clean room environment and how to safely egress the clean room workspace.
S7	The hazards and risks associated with the science manufacturing plant operation and environment and the use of correct personal protective equipment (PPE) and safety equipment to ensure safe plant operation and safety in the workplace.
24	Understands the foundations of health and safety including responsibility for health and safety under HASWA
25	Understands the procedures for first aid relevant to the workplace
26	Understands risk assessment & control including Control of Substances Hazardous to Health assessments, where appropriate and Safety Data Sheets
27	Understands fire and electrical safety procedures in the workplace
28	Understands safe manual handling
29	Understands the risks of repetitive activities, including use of display screen equipment
30	Understands Hazardous area classification & DSEAR regulations, where appropriate, and how they apply within area of responsibility
31	Understands site and local emergency procedures
32	Understands the hazards, safety precautions and PPE required to safely start up and operate machinery and equipment in the process
33	Understand the principles of the working environment that may include specialist requirements and conditions such as GMP, Flammable Atmospheres, lone working or confined spaces
34	Basic understanding of the principles of product safety relevant to the sector and sponsoring organisation
35	Understands relevant organisation safety policies and procedures

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REQUIREMENTS: SKILLS	
S8	Prepare science manufacturing materials, plant and equipment, for hand or machine based process operations, typically using pumps, valves, temperature gauges, filtration equipment, tanks and vessels; including checking availability and quality of materials, correct conditions and safety checks according to standard operating procedures.
36	Follow operating instructions to use systems and processes to receive incoming raw materials in containers, packages or via piped systems in preparation for a process
37	Follow operating instructions to perform and/or explain the processes involved in the preparation for the start-up of a process or the preparation of materials and feedstocks prior to a hand based operation
38	Use the hazards & safety precautions, including PPE, required to safely prepare and handle materials and operate machinery
39	Use good housekeeping practices and maintain work area free of hazards and contamination
40	Use systems and processes to check any plant or equipment is safe and fit for use, and report any defects as a result of these checks
S9	Start-up a basic science manufacturing machine based or hand based processes, typically using equipment as above, following process operating instructions.
41	Follow operating instructions to perform processes involved in the start-up of a process or the hand based operations to complete part or all of the production process
42	Identify and use the appropriate instructions for the process or hand based operation (may include paper and/or computer based information files)
43	Use appropriate system and processes to ensure all materials are in place, in the correct quantity and quality and ready for use in the process
S10	Perform operations and monitor basic science manufacturing process according to company safe working practices as directed by line manager.
44	Comply with the safe operating conditions of plant and equipment

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45	Demonstrate and/or explain the monitoring and maintaining processes involved in the operation of the process or the phases of a hand based operation
46	Comply with common risks and control measures
47	Carry out plant and equipment integrity checks within the scope of personal responsibility and in line with company procedures, complete documentation and report abnormal conditions appropriately
48	Comply with hazardous area classification, DSEAR regulations, where applicable, and emergency response procedures
49	Use appropriate personal protective equipment e.g. face mask, fume hood
S11	Produce a representative sample of science manufacturing product for quality test purposes and inspect products to ensure quality is maintained in line with company quality procedures.
50	Use checks and sampling processes appropriate to the monitoring and final quality procedures
51	Maintain product quality by finishing and use of simple sampling & testing
52	Explain the quality procedures required to maintain intermediate and final product quality
53	Identify the location of quality procedures documentation (paper or computer based files)
54	Escalate problems and issues related to quality issues when unable to resolve
55	Use the labelling system as per instruction for product identification
S12	Carry out assembly and finishing operations for a machine or hand based process operation in science manufacturing process.
56	Prepare process materials or feeds for start-up and between production stages according to work instructions
57	Clean and prepare items of plant, facility and equipment

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58	Access, use and interpret documentation and logs, and pass on information, for example during handover
59	Separate & dispose of by-products and waste as appropriate
60	Describe the safe transfer of finished or intermediate products or material to other site locations (internal to and external to operating site)
S13	Make simple adjustments to the science manufacturing process to remedy problems, reporting any problems or abnormal conditions when unable or unauthorised to resolve.
61	Use simple problem solving and work organisational methods, including lean manufacturing, Kaizen, visual aids, workplace organisation systems and techniques
62	Identify problems and their basic root causes
63	Support the implementation of satisfactory solutions
64	Support the implementation of solutions as directed by line manager or supervisor
S14	Shut down/complete a basic science manufacturing process following process operating instructions.
65	Use safe shutdown processes involved in the operation of the process or a hand based operation
66	Make safe the process plant or equipment for maintenance and/or hand over to other team members
S15	Comply with the Health, Safety and Environmental regulations, including correct use of PPE.
67	Comply with foundations of health and safety including responsibility for health and safety under HASWA
68	Comply with the procedures for first aid relevant to the workplace
69	Comply with risk assessment & control procedures
70	Comply with practice site/plant safety requirements including for example <ul style="list-style-type: none"> • Fire

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	<ul style="list-style-type: none"> • COSHH • Working at Height • Confined Spaces • Lock-out procedures • Permits to work
71	Take responsibility for the appropriate use of personal protective equipment e.g. respirators, breathing air hoods, protective suits, face masks, gloves etc.
72	Comply with the relevant company environmental control procedures
73	Can describe the process of spillage and waste materials disposal
74	Can explain the principles of process safety relevant to the sector and sponsoring organisation
S16	Comply with and meet the requirements of their company quality standards.
75	Comply with the quality requirements of the company, the product and or process
76	Comply with the principles of product safety relevant to the sector and sponsoring organisation
S17	Work to and meet the requirements of standard operating procedures relevant to their scope of work.
77	Prepare process materials and feeds for start- up in line with work instructions
78	Clean and prepare the work area and equipment in line with work instructions
79	Prepare to start up a routine manufacturing process in line with company SOPs
80	Individually or as part of a team, start up a routine machine based manufacturing process in accordance with company SOPs
81	Either individually or as part of a team, operate a routine machine based manufacturing process in accordance with company SOPs

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82	Either individually or as part of a team, shut down/complete a routine machine based manufacturing process in accordance with company SOPs
83	Run and monitor a routine machine based process or plant and equipment, reporting any problems or abnormal conditions when unable or unauthorised to remedy by way of making process adjustments
S18	Comply with instructions pertaining to the internal and external regulatory requirements set by the relevant competent authority and/or specified by the company.
84	Comply with external regulations relating to the company and the process (e.g. COMAH, NII, MHRA)
85	Comply with internal and external regulations relating to the company and the process
S19	Complete routine documentation such as quality inspection sheets and production records.
86	Proficiently complete documentation and data records in line with company procedures; this may include the use of computers and software as appropriate
S20	Perform simple calculations associated with the operation, for example raw material quantity and production calculations.
87	Use of simple mathematical principles to perform calculations relevant to the process
88	Use the results of calculations appropriate to the process requirements
S21	Support process manufacturing improvement activities, for example implementing plant improvements as directed and responding to plant and process change requirements.
89	Participate in and contribute to continuous improvement projects

REQUIREMENTS: BEHAVIOURS

S22	Communicates effectively to support the working of the team
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90	Uses the appropriate English, numeracy and digital knowledge to understand instructions, complete simple mathematical calculations and use computer systems appropriate to the manufacturing process
91	Effective communication, using a full range of skills: speaking clearly, listening, writing, body language and presentation
92	Works to the required standard of accuracy, neatness and thoroughness. Often makes valued contributions to team quality
93	Passes on information both verbal and written, in a way that is easily understood to a wider team audience
94	Receptive to other people's point of view
95	Listens and will question and challenge appropriately to enhance own understanding
96	Readily comprehends oral and/or written instructions when first presented
S23	Accepts responsibility of own work and the impact of own work on others.
97	Understands the impact of work on others, especially where related to equality and diversity
98	Works autonomously, can be trusted to complete tasks
99	Usually tactful, considerate and respectful in dealing with others, exercising responsibilities in an ethical manner
100	Understands and adheres to the regulations relating to equality
S24	Displays a willingness to contribute to the work of others.
101	Works and interacts effectively within a team
102	Works cooperatively with others to achieve overall team goals and understands how these influence the wider organisation
103	Demonstrates knowledge and understanding of team organisation goals and how this fits into the department aims

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S25	Shows respect for others, having regard for diversity and equality.
104	Understands and adheres to the regulations relating to equality and diversity
105	Respects and encourages the value of others. Work effectively with colleagues and be aware of the needs and concerns of others, especially where related to diversity and equality
106	Aware of the needs and concerns of others, especially where related to diversity and equality
S26	Manages own time, being punctual, reliable and completes work to agreed schedule.
107	Time management and ability to complete work to a schedule
S27	Respond positively to change in the working environment.
108	Ability to handle change and respond to change management processes
109	Aware of the principles of change management and how they apply to the place of work
110	Flexible, willing and able to respond to changes in work situations and/or learn new skill
111	Works hard to implement successful change in areas of responsibility as directed by supervisor

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